

REMARKS

The present application includes pending claims 1-25, all of which have been rejected. By this Amendment, claims 1 and 14 have been amended as set forth above. The Applicants respectfully submit that the claims define patentable subject matter.

Claims 1-5, 9, and 13 stand rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,759,070 (“Voroba”). Claims 6-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of United States Patent No. 6,381,333 (“Suzuki”). Claims 10-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of United States Patent No. 5,260,920 (“Ide”). Claims 14-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,825,894 (“Shennib”) in view of United States Patent No. 6,067,360 (“Kasai”). Claims 21, 22, 24, and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ide in view of Voroba. Claim 23 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of Kasai. The Applicants respectfully traverse these rejections at least for the reasons set forth below.

I. Voroba Does Not Anticipate Claims 1-5, 9, And 13

The Applicants first turn to the rejection of claims 1-5, 9, and 13 as being anticipated by Voroba. “A claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *See* Manual of Patent Examining Procedure (MPEP) at 2131 (internal citation omitted). Further, “[t]he identical invention must be shown in as complete detail as it is contained... in the claim.” *See id.* (internal citation omitted).

Voroba discloses a “programmable patient controlled master hearing aid... which

consists of a hearing aid test module, an operator's console and a patient's console, both of which are microprocessor based, and all of which are interconnected to provide a testing apparatus which is used by the patient to select electronic components to be employed (sic) in a hearing aid." Voroba at Abstract.

Voroba discloses an "audio board" that switches and mixes sound. *See id.* at column 7, lines 4-9 ("Both tape decks 65, 66 are connected to an audio board 69 which switches and mixes the sound which is connected to power amplifiers 71 for each of the four speakers 22...."). Voroba, however, does not expressly or inherently describe an audio signal processing system that includes an audiometer, as recited in claim 1.

A. Voroba Does Not Explicitly Describe A Clinical Audiometer

The Office Action admits that Voroba does not explicitly disclose an audiometer. *See* June 10, 2005 Office Action at page 2 ("... Voroba does not explicitly disclose an audiometer..."). The Office Action, however, attempts to overcome this deficiency by stating that "Voroba discloses testing a patients perception of hearing, i.e., audiometer, Col. 3, lines 26-66).

The passage cited by the Office Action, however, does not explicitly or inherently describe a clinical audiometer. Instead, Voroba only discloses mixing sound, which may be performed with a standard mixer.

Tape decks are provided for the presentation of a "target stimulus" (e.g., background noise or competing speech signals). Outputs from the tape decks **are electronically mixed** and preferably provided in a multiphonic sound field around the patient, that is, with sound emanating toward the patient from many directions.

Voroba at column 3, lines 18-25 (emphasis added). The passage cited in the Office Action does not explicitly or inherently describe a clinical audiometer. Instead, as shown above, Voroba only discloses mixing sound, which may be performed with a standard mixer.

B. Voroba Does Not Inherently Describe A Clinical Audiometer

The Office Action seemingly assumes that Voroba inherently describes a clinical audiometer, because such a component is clearly not explicitly described in Voroba, and the Office Action concedes as much. *See* June 10, 2005 Office Action at page 2 (“... Voroba does not explicitly disclose an audiometer...”).

The Applicants submit that the a rejection based on inherency must include a statement of the rationale or evidence tending to show inherency. *See* Manual of Patent Examining Procedure at § 2112. “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” *See id. citing In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Voroba only discloses “electronically mixing” sound, which can be accomplished through a standard mixer. Voroba, however, does not explicitly or inherently disclose a clinical audiometer.

To establish inherency, the extrinsic evidence “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. **Inherency, however, may not be established by probabilities or possibilities.** The mere fact that a certain

thing may result from a given set of circumstances is not sufficient.

In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (emphasis added). The Applicants respectfully submit that neither Voroba nor the Office Action “make[s] clear that the missing descriptive matter,” that is, a clinical audiometer, “is necessarily present in” Voroba.

C. Claims 1-5, 9, And 13 Should Be In Condition For Allowance

The Applicants respectfully submit that Voroba does not explicitly or inherently disclose an audio signal processing system that comprises a clinical audiometer, such as recited in claims 1-5, 9, and 13. Thus, at least for this reason, these claims should be in condition for allowance.

D. Voroba Also Does Not Expressly Or Inherently Disclose Loudspeakers That Are Placed And Oriented Arbitrarily About A Listening Position

The Applicants also respectfully submit that Voroba does not expressly or inherently disclose loudspeakers that are placed and oriented **arbitrarily** about the listening position, as recited in claims 2 and 3. The Office Action states that the “term ‘arbitrarily’ is broad.” *See* June 10, 2005 Office Action at page 3. Webster’s Collegiate Dictionary, 10th Edition (2001) defines arbitrary, inter alia, as follows:

Based on or determined by individual preference or convenience rather than by necessity or the intrinsic nature of something.... existing or coming about seemingly at random or by chance....

The Applicants have enclosed a copy of page 59 of Webster’s Collegiate Dictionary, 10th Edition (2005), which lists “arbitrary.” The term “arbitrarily” has a clear meaning as

shown above, and is not overly broad as suggested in the Office Action.

Voroba clearly does not explicitly or inherently describe loudspeakers that are placed and oriented **arbitrarily** about the listening position, as recited in claims 2 and 3. In fact, Voroba actually teaches away from arbitrary placement. For example, Voroba discloses the following:

The patient is preferably situated in a sound field listening environment such as that shown in FIG. 1 with a plurality of speakers 22 arrayed around the patient's head so that the natural hearing environment in which the aid is to (sic) used can be recreated. **The speaker array is situated so that the physical design and natural acoustic characteristics of the head and human hearing mechanism are fully utilized during the evaluation.**

Id. at column 5, lines 54-61 (emphasis added). Such an arrangement is not arbitrary, i.e., based on individual preference and/or at random. Rather, the speaker arrangement is dictated by the "physical design and natural acoustic characteristics of the head and human hearing mechanism." Thus, the Applicants respectfully submit that Voroba does not anticipate claims 2 and 3 at least for this reason.

Additionally, with respect to claim 3, Voroba does not expressly or inherently describe loudspeakers that face different directions relative to each other and relative to the listening position. As clearly shown in Figure 1 of Voroba, the speakers 22 all face the listening area. Thus, at least for this reason, the Applicants respectfully submit that Voroba does not anticipate claim 3.

II. The Combination Of Voroba And Suzuki Does Not Render Claims 6-8 Unpatentable

The Applicants next turn to the rejection of claims 6-8 as being unpatentable over Voroba in view of Suzuki. The Applicants respectfully submit that the combination of Voroba and Suxuki does not render claims 6-8 unpatentable at least for the reasons discussed above.

III. The Combination Of Voroba And Ide Does Not Render Claims 10-12 Unpatentable

The Applicants now turn to the rejection of claims 10-12 as being unpatentable over Voroba in view of Ide. The Applicants respectfully submit that the combination of Voroba and Ide does not render claims 10-12 unpatentable at least for the reasons discussed above.

IV. The Combination Of Shennib And Kasai Does Not Render Claims 14-20 Unpatentable

The Applicants now turn to the rejection of claims 14-20 as being unpatentable over Shennib in view of Kasai.

A. The Combination Of Shennib And Kasai Does Not Disclose A Speaker That Is Directly Overhead

The Office Action states that “Figure 7 [of Shennib] discloses speaker 93 located over the head position and center”. June 10, 2005 Office Action at page 7. Shennib discloses a system in which “[t]hree of the speakers, i.e., #1 (89), #5 (93), and #6 (94) are located in the sagittal plane 96 containing the head reference point 88. Speakers #1, #5, and #6 are positioned at altitude angles 0° , 45° , and -45° , respectively, as shown in FIG. 7 at B.” Shennib at column 15, lines 7-11.

As shown in Figure 7 of Shennib, the speaker 93 is located in front of, and above,

the head reference point 88 at an altitude angle of 45^0 with respect to the head reference point 88. Because the speaker 93 is in front of the head reference point 88, it is not directly overhead. Speaker 93 is not “located at an **overhead center position directly above** the test subject in the listening position.” Further, Kasai also does not teach or suggest a speaker located at such a position. Thus, the Applicants respectfully submit that the combination of Shennib and Kasai does not render claims 14-20 unpatentable at least for this reason.

B. One Having Ordinary Skill In The Art Would Not Be Motivated To Combine Shennib And Kasai

The Applicants maintain that one having ordinary skill in the art would not be motivated to combine Shennib and Kasai to produce a “multi channel sound reproduction system for testing hearing and hearing aids,” as recited in the claims of the present application. Shennib “relates to hearing evaluation and hearing aid fitting.” Shennib at column 1, lines 10-13. On the other hand, Kasai relates to “an apparatus and method for localizing a sound image, more specifically the simplification of its structure and processes.” Kasai at column 1, lines 15-17. In particular, Kasai relates to “surround sound” systems, such as used for home entertainment purposes.

The Applicants respectfully submit that these are nonanalogous areas of art and one having ordinary skill in the art would not be motivated to combine them. As set forth in the background section of the present application at pages 6-7:

It may be suggested that a system similar to entertainment “surround sound” systems may be used to address many of the above-mentioned problems. **However, such entertainment systems are not suited for use in hearing**

and hearing aid assessment for many reasons. For example, in entertainment audio systems, the loudspeakers are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple listeners. As with previous multiple-loudspeaker systems used in hearing and hearing-aid assessment, signals received by listeners from such entertainment audio systems contain a substantial contribution of the acoustical qualities of the listening environment. In any system that delivers signals containing the acoustical qualities of the listening environment as such, a given recording sounds somewhat different in different listening environments and has different acoustical qualities in each listening environment. Such systems, therefore, do not enable the desired standardization for hearing and hearing aid assessment.

In addition, entertainment audio systems are designed so that background noises presented to the listener enhance or support the reception of an entertainment event, such as a primary audio signal or a visual picture. In the real world, however, background noises presented to the listener do not enhance or support the reception of a primary audio signal or a visual picture. Instead, background noises disrupt or compete with the reception of such primary stimuli, resulting in conditions under which the reception of such primary stimuli breaks down. It is these real-world conditions that are desirable for hearing and hearing aid assessment.

As such, the Applicants respectfully submit that one would not be motivated to combine

the entertainment audio system of Kasai with the system of Shennib to produce the system for testing hearing and hearing aids as recited by the claims of the present application. At least for this reason, the Applicants respectfully submit that claims 14-20 should be in condition for allowance.

V. The Combination Of Ide And Voroba Is Improper

The Applicants now turn to the rejection of claims 21, 22, 24, and 25 as being unpatentable over Ide in view of Voroba. The Applicants respectfully maintain that one having ordinary skill in the art would not be motivated to combine Voroba with Ide to produce the inventions recited in the claims of the present application. Voroba discloses a “programmable patient controlled master hearing aid” (*See* Voroba at Abstract), while Ide discloses a “system for reproducing a sound field simulating a real acoustic space” (*See* Ide at Abstract).

As discussed in the background of the present application:

However, such entertainment systems are not suited for use in hearing and hearing aid assessment for many reasons. **For example, in entertainment audio systems, the loudspeakers are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple listeners.**

In stark contrast, the sound reproduction system of Ide is located in a large room.

FIG. 2 shows an example of construction of the sound reproduction system according to the invention. As the sound reproduction system, a three-dimensional space 40 which is substantially similar to the assumed three-dimensional space 10 of the sound collection system is

assumed to exist. As the three dimensional space 40 of the sound reproduction system, **a room, e.g., a listening room, can be used. In the case of using a larger space, like halls or an outdoor space, the entire space can be used by zoning a determined space or ignoring the capacity of space.**

Ide at column 5, lines 10-20 (emphasis added). In short, Ide discloses a system in which speakers are placed at relatively large distances from one another in a room. As discussed in the present application, such entertainment systems are not suited for use in hearing aid assessment for many reasons. The speakers disclosed in Ide are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple listeners. One having ordinary skill in the art would not be motivated to combine Ide with any other reference to produce systems or methods recited in the claims of the present application, which are directed to testing hearing and hearing aids. Thus, the Applicants respectfully submit that claims 21, 22, 24, and 25 should be in condition for allowance, at least for this reason.

VI. The Combination Of Voroba And Kasai Is Improper

The Applicants finally turn to the rejection of claim 23 as being unpatentable over Voroba in view of Kasai. The Applicants respectfully submit that one having ordinary skill in the art would not be motivated to combine Kasai with Voroba. As discussed above, Kasai relates to “an apparatus and method for localizing a sound image, more specifically the simplification of its structure and processes.” Kasai at column 1, lines 15-17. In particular, Kasai relates to “surround sound” systems used for entertainment purposes. As discussed in the present application, such entertainment systems are not

suited for use in hearing aid assessment for many reasons. One having ordinary skill in the art would not be motivated to combine Kasai with any other reference to produce a system or method as recited in the claims of the present application, which are directed to testing hearing and hearing aids. Thus, at least for this reason, the Applicants respectfully submit that claim 23 should be in condition for allowance.

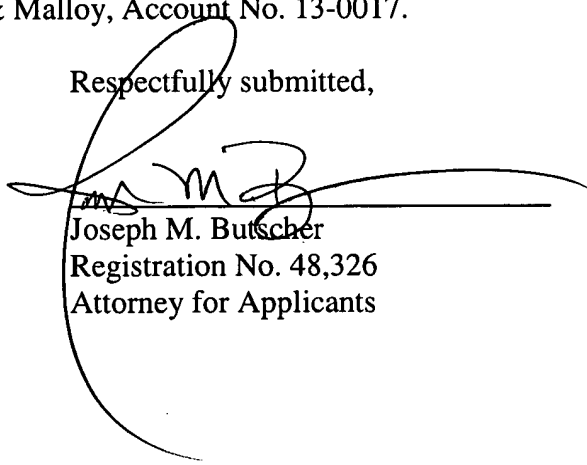
VII. Conclusion

The Applicants respectfully submit that claims 1-25 of the present application should be in condition for allowance at least for the reasons discussed above and request reconsideration of the claim rejections. If the Examiner has any questions or the Applicants can be of any assistance, the Examiner is invited to contact the Applicants. The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

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MCANDREWS, HELD & MALLOY, LTD.
500 West Madison Street, 34th Floor
Chicago, Illinois 60661
Telephone: (312) 775-8000
Facsimile: (312) 775-8100

Respectfully submitted,



Joseph M. Butscher
Registration No. 48,326
Attorney for Applicants

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ic numeral *n* (ca. 1847) : any of the number symbols 0, 1, 2, 3, 4, 5, 8, 9 — see NUMBER table
i-nose \ə-ˈrə-bə-nōs, -nōz/ *n* [ISV *arabin* (the solid principle in sugar C₅H₁₀O₅ occurring esp. in vegetable gums
i-no-side \ar-ə-ˈbi-nə-sid, -ə-ˈrə-bə-nō-sid/ *n* (1927) : a glycoside yields arabinose on hydrolysis

ise *Brit var* of ARABIZE
ism \ar-ə-ˈbi-zəm/ *n* (1614) 1 : a characteristic feature of Arabic occurring in another language 2 : devotion to Arab interests, cultural aspirations, or ideals

ist \ar-ə-ˈbist/ *n* (1753) 1 : a specialist in the Arabic language or Arabic culture 2 : a person who favors Arab interests and positions international affairs

ize \ar-ə-ˈbiz/ *vt* -ized, -iz-ing (1883) 1 *a* : to cause to acquire customs, manners, speech, or outlook *b* : to modify (a population) by intermarriage with Arabs 2 : ARABICIZE 1 — **Ar-ab-i-za-tion** \ə-ˈbā-zā-shən/ *n*

ble \ar-ə-ˈbəl/ *adj* [MF or L; MF, fr. L *arabilis*, fr. *arare* to plow; to OE *erian* to plow, Gk *aroun*] (15c) 1 : fit for or used for the tilling of crops 2 *Brit* : engaged in, produced by, or being the cultivation of arable land — **ar-a-bil-i-ty** \ar-ə-ˈbi-li-tē/ *n*

le *n* (1576) chiefly *Brit* : land fit or used for the growing of crops; a plot of such land (the village ~ of Anglo-Saxon times)

chidonic acid \ar-ə-ˈkə-dā-nik/ *n* [NL *Arachid.*, *Arachis* + E *as* (as in *gluconic acid*)] (1913) : a liquid unsaturated fatty acid C₁₉H₃₅O₂ that occurs in most animal fats, is a precursor of prostaglandins, and is considered essential in animal nutrition

chis oil \ar-ə-ˈkəs-əl/ *n* [NL *Arachis*, genus that includes the peanut, Gk *arakis*, dim. of *arakos*, a legume] (ca. 1889) : PEANUT OIL

hmid \ar-ə-ˈrak-nəd, -nīd/ *n* [NL *Arachnida*, fr. Gk *arachnē* spider] 39) : any of a class (Arachnida) of arthropods comprising chiefly terrestrial invertebrates, including the spiders, scorpions, mites, and ticks, and having a segmented body divided into two regions of which the anterior bears four pairs of legs but no antennae — **arachnid** *adj*

ch-noid \ar-ə-ˈrak-nōid/ *adj* (1789) 1 : of or relating to a thin membrane of the brain and spinal cord that lies between the dura mater and pia mater 2 : covered with or composed of soft loose hairs or filaments

chnoid *n* [NL *Arachnoides*, fr. Gk *arachnoeidēs*, like a cobweb, fr. *chmē* spider, spider's web] (ca. 1847) : an arachnoid membrane

chnoid *adj* [NL *Arachnida* + E -oid] (1852) : resembling or related to the arachnids

gonite \ar-ə-ˈgə-nīt, -ar-ə-ˈgə-nīt/ *n* [G *Aragonit*, fr. *Aragon*, Spain] 03) : a mineral similar to calcite in consisting of calcium carbonate : differing from calcite in its orthorhombic crystallization, greater cleavage, and less distinct cleavage — **ara-go-nit-ic** \ar-ə-ˈgə-nī-tik, -ar-ə-ˈnīt/ *adj*

ik *var* of ARACK
mae-an \ar-ə-ˈmē-ən/ *n* [L *Aramaean*, fr. Gk *Aramaioi*, fr. Heb *amram*, ancient name for Syria] (1839) 1 : ARAMAIC 2 : a member of a Semitic people of the second millennium B.C. in Syria and Upper Mesopotamia — **Aramaean** *adj*

ma-ic \ar-ə-ˈmā-ik/ *n* (1882) : a Semitic language known since the 1st century B.C. as the speech of the Aramaeans and later used extensively in southwest Asia as a commercial and governmental language adopted as their customary speech by various non-Aramaean peoples including the Jews after the Babylonian exile

maic alphabet *n* (1925) 1 : an extinct North Semitic alphabet dating from the ninth century B.C. which was for several centuries the commercial alphabet of southwest Asia and the parent of other alphabets (as Syriac and Arabic) 2 : the square Hebrew alphabet as distinguished from the early Hebrew alphabet

mid \ar-ə-ˈmīd, -mīd/ *n* [aromatic polyamide] (1972) : any of a class of light-weight but very strong heat-resistant synthetic aromatic polyamide materials that are fashioned into fibers, filaments, or sheets and used esp. in textiles and plastics

ap-a-ho or **Arap-a-ho** \ar-ə-ˈpə-hə/ *n*, *pl* -ho or -hos or -hoe or -oes (1812) 1 : a member of an American Indian people of the plains region ranging from Saskatchewan and Manitoba to New Mexico and Texas 2 : the Algonquian language of the Arapaho people

au-ca-ni-an \ar-ə-ˈka-nē-ən, -ar-ə-ˈkā- also **Arau-can** \ar-ə-ˈraʊ-m/ *n* [Sp *araucano*, fr. *Arauco*, former province in Chile] (1809) 1 : a member of a group of Indian peoples of south central Chile and adjacent regions of Argentina 2 : the language of the Araucanian people that constitutes an independent language family — **Araucanian** *adj*

au-ca-ia \ar-ə-ˈkar-ē-ə/ *n* [NL, fr. *Arauco*] (1809) : any of a genus *Araucaria* of the family Araucariaceae, the araucaria family) of Southern or Australian coniferous trees that resemble pines and are often grown as ornamentals — **ar-au-car-i-an** \ar-ə-ˈn/ *adj*

awak \ar-ə-ˈwāk, -wāk/ *n*, *pl* **Arawak** or **Arawaks** (1769) 1 : a member of an Indian people of the Arawakan group now living chiefly on the coast of Guyana 2 : the language of the Arawak people

awak-an \ar-ə-ˈwā-kən, -wā- / *n*, *pl* **Arawakan** or **Arawakans** (1901) 1 : a member of a group of Indian peoples of South America and the West Indies 2 : the language family of the Arawakan peoples

arbit \ar-ə-ˈbɪt/ *n* (1979) : ARBITRAGEUR
ar-bit or **ar-bit** \ar-ə-ˈbɪt/ *n* [ME *arblast*, fr. OE, fr. OF *arblast*, fr. LL *arcballista*, fr. L *arcus* bow + *ballista* — more at ARROW] ref. 12c) : a crossbow esp. of medieval times

arbitrage *vi* -traged; -trag-ing (1900) : to engage in arbitrage
ar-bi-tra-geur \är-bə-(trə-ˈzhər) or **ar-bi-trag-er** \är-bə-trä-ˈzhər/ *n* [F *arbitrageur*, fr. *arbitrage*] (1870) : one that practices arbitrage
ar-bi-tral \är-bə-trəl/ *adj* (1609) : of or relating to arbiters or arbitration

ar-bit-ram-ent \är-ˈbi-trä-mənt/ *n* [ME, fr. MF *arbitrement*, fr. *arbitrer*] (15c) 1 *archaic* : the right or power of deciding 2 : the settling of a dispute by an arbiter 3 : the judgment given by an arbitrator

ar-bi-trary \är-bə-trer-ē/ *adj* (15c) 1 : depending on individual discretion (as of a judge) and not fixed by law (the manner of punishment is ~) 2 *a* : not restrained or limited in the exercise of power : ruling by absolute authority (an ~ government) *b* : marked by or resulting from the unrestrained and often tyrannical exercise of power (protection from ~ arrest and detention) 3 *a* : based on or determined by individual preference or convenience rather than by necessity or the intrinsic nature of something (an ~ standard) (take any ~ positive number) (the ~ division of historical studies into watertight compartments — A. J. Toynbee) *b* : existing or coming about seemingly at random or by chance or as a capricious and unreasonable act of will (when a task is not seen in a meaningful context it is experienced as being ~ — Nehemiah Jordan) — **ar-bi-trar-i-ly** \är-bə-trer-ə-lē/ *adv* — **ar-bi-trar-i-ness** \är-bə-trer-ē-nəs/ *n*

ar-bi-trar-i-ness \är-bə-trer-ē-nəs/ *n*
ar-bi-trate \är-bə-trä-tər/ *vb* -trat-ed; -trat-ing *vt* (1592) 1 *archaic* : DECIDE, DETERMINE 2 : to act as arbiter upon 3 : to submit or refer for decision to an arbiter (agreed to ~ their differences) ~ *vi* : to act as arbitrator — **ar-bi-trat-ive** \ä-trä-tiv/ *adj*

ar-bi-tra-tion \är-bə-trä-shən/ *n* (15c) : the action of arbitrating; esp. the hearing and determination of a case in controversy by an arbiter — **ar-bi-tra-tion-al** \sh(ə)-nəl/ *adj*

ar-bi-tra-tor \är-bə-trä-tər/ *n* (15c) : one that arbitrates : ARBITER
ar-bor \är-bər/ *n* [ME *erbor* plot of grass, arbor, fr. MF *herbier* plot of grass, fr. *herbe* herb, grass] (14c) : a shelter of vines or branches or of lattice-work covered with climbing shrubs or vines

arbor *n* [L, tree, shaft] (1659) 1 : a spindle or axle of a wheel 2 : a main shaft or beam 3 : a shaft on which a revolving cutting tool is mounted 4 : a spindle on a cutting machine that holds the work to be cut

arbor- or arbori- *comb form* [L *arbor*] : tree (arboriculture)
Arbor Day *n* [L *arbor* tree] (1872) : a day designated for planting trees

ar-bo-re-al \är-bör-ē-əl, -bör-/ *adj* [L *arbores* of a tree, fr. *arbor*] (ca. 1667) 1 : of, relating to, or resembling a tree 2 : inhabiting or frequenting trees (the ~ monkeys) — **ar-bo-re-al-ly** \ä-lē/ *adv*

ar-bo-re-ous \är-bör-ē-əs/ *adj* (1646) : ARBOREAL (an ~ palm)
ar-bo-res-cent \är-bör-ē-sənt/ *adj* (1675) : resembling a tree in properties, growth, structure, or appearance — **ar-bo-res-cence** \s(ə)-n(t)s/ *n*

ar-bo-re-tum \är-bör-ē-təm/ *n*, *pl* -retums or -re-ta \-rē-tə/ [NL, fr. L, plantation of trees, fr. *arbor*] (1838) : a place where trees, shrubs, and herbaceous plants are cultivated for scientific and educational purposes

ar-bor-i-cul-ture \är-bör-ə-kəl-čər, är-bör-ə-/ *n* [arbori- + -culture (as in *agriculture*)] (1828) : the cultivation of trees and shrubs esp. for ornamental purposes — **ar-bor-i-cul-tur-al** \är-bör-ə-kəl-čər-əl, är-bör-ə-/ *adj*

ar-bor-ist \är-bör-rist/ *n* (1578) : a specialist in the care and maintenance of trees

ar-bor-i-za-tion \är-bör-ə-zā-shən/ *n* (1794) : formation of or into an arborescent figure or arrangement; also : such a figure or arrangement (as a dendritic process of a nerve cell)

ar-bor-ize \är-bör-riz/ *vi* -ized, -iz-ing (1847) : to branch freely and repeatedly

ar-bor-vi-tae \är-bör-vi-tē/ *n* [NL *arbor vitae*, lit., tree of life] (1646) : any of various evergreen trees and shrubs (esp. genus *Thuja*) of the cypress family that usu. have closely overlapping or compressed scale leaves and are often grown for ornament and in hedges

ar-bour chiefly *Brit var* of ARBOR
ar-bo-vi-rus \är-bör-vi-rəs/ *n* [arthropod-borne virus] (1957) : any of various RNA viruses (as the causative agents of encephalitis, yellow fever, and dengue) transmitted chiefly by arthropods

ar-bu-tus \är-byū-təs/ *n* [NL, fr. L, strawberry tree] (1548) 1 : any of a genus (*Arbutus*) of shrubs and trees of the heath family with white or pink flowers and red or orange berries 2 : a creeping plant (*Epigaea repens*) of the heath family that occurs in eastern No. America and bears fragrant pink or white flowers in early spring

arc \ärk/ *n* [ME *ark*, fr. MF *arc* bow, fr. L *arcus* bow, arch, arc — more at ARROW] (14c) 1 : the apparent path described above and below the horizon by a celestial body (as the sun) 2 : something arched or curved 3 : a sustained luminous discharge of electricity across a gap in a circuit or between electrodes; also : ARC LAMP 4 : a continuous portion (as of a circle or ellipse) of a curved line 5 : degree measurement on the circumference of a circle — used esp. in the phrase of arc (11 minutes 3 seconds of ~)

arc *adj* [arc sine arc or angle (corresponding to the) sine (of so many degrees)] (ca. 1949) : INVERSE 2 — used with the trigonometric functions and hyperbolic functions

ar-cade \är-kād/ *n* [F, fr. It *arcata*, fr. *arco* arch, fr. L *arcus*] (1725) 1 : a long arched building or gallery 2 : an arched covered passageway or avenue (as between shops) 3 : a series of arches with their columns

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